



# Innovation in Defense Acquisition Oversight: An Exploration of the AT&L Acquisition Visibility SOA

Presented: May 13, 2010

***Russell Vogel***

*Acquisition Resource and Analysis  
Office of the Under Secretary of Defense for  
Acquisition, Technology and Logistics  
(703) 845-6677  
[Russell.Vogel@osd.mil](mailto:Russell.Vogel@osd.mil)*

***Robert M. Flowe***

*Acquisition Visibility – Service Oriented  
Architecture (AV SOA)  
Office of the Under Secretary of Defense for  
Acquisition, Technology and Logistics  
(703) 699-0183  
[Robert.Flowe@osd.mil](mailto:Robert.Flowe@osd.mil)*

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE <b>13 MAY 2010</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2010 to 00-00-2010</b>	
4. TITLE AND SUBTITLE <b>Innovation in Defense Acquisition Oversight: An Exploration of the AT&amp;L Acquisition Visibility SOA</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Ofc of the Under Secretary of Defense for Acquisition, Technology and Logistics, Acquisition Resource and Analysis, Washington, DC, 20301</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>7th Annual Acquisition Research Symposium to be held May 12-13, 2010 in Monterey, California.</b>					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>18</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			



## Agenda

- ▶ Acquisition Visibility Purpose
- ▶ Project History – AT&L AV SOA
- ▶ Architecture
- ▶ Data Elements and Programs included to date
- ▶ Implications for Academic Research



## Acquisition Visibility

- ▶ The Department of Defense and others have noted deficiencies in the Department's ability to manage its \$1.6T portfolio of Major Defense Acquisition Programs.
- ▶ Undersecretary of Defense for Acquisition Technology & Logistics is addressing these deficiencies by focusing on Acquisition Visibility (AV)

### Acquisition Visibility

Timely access to accurate, authoritative, and reliable information supporting acquisition oversight, accountability, and decision making throughout the Department for effective and efficient delivery of warfighter capabilities



## Project History – AT&L AV SOA

- ▶ **Demo:** February 2008 demonstration of data governance and Service Oriented Architecture to support major weapons system decision making. Completed in ~45 days.
  - Included 61 data elements ( Earned Value Management and Unit Cost) for 12 Major Defense Acquisition Programs (MDAPs)—4 from each Military Service
- ▶ **Pilot:** 2008-2009 pilot to solidify governance and technical approach.
  - In December 2008, provided acquisition oversight decision-making information for 37 MDAPs, totaling ~\$1.2T in program value, ~75% of the FYDP.
  - In fall 2009, provided 103 MDAPs and other major programs totaling ~\$1.6T
  - ~148 data elements (Earned Value Management, Program Administration, Unit Cost, Science and Technology, Milestones, Budget/Current Estimate)



# AT&L AV SOA – Full Implementation Approval

## March 5, 2009

THE UNDER SECRETARY OF DEFENSE  
3010 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3010

MEMORANDUM FOR SERVICE ACQUISITION EXECUTIVES

SUBJECT: Full Implementation of Acquisition Visibility (AV) Service Oriented Architecture (SOA) within DoD Acquisition Community

In my July 25, 2008 memorandum I directed the capability of the Acquisition Visibility Service (AVS) to capture and publish authoritative data for a set of the MDAP funding over the FYDP. With your initial operational capability. Pilot users from all offices are already registered and testing the capabilities. By June all DoD acquisition personnel may establish capability.

We have also re-plumbed the workings of management tools — DAMIR and Kaleidoscope access this new and useful data source. An additional users' desktop for use by any means desired is covers 37 of our largest MDAPs, and more will be included in time to support the FY2011 program.

I am now directing we put in place all the provide "acquisition data as a service" to the enterprise must be flexible and scalable enough to pilot covers, in order to expand current data governance serve other aspects of AT&L operations such as others. Based on lessons learned from the pilot industry, leads me to the following decisions for providing a permanent resource basis:

- **Governance Forum.** The Weapon System Steering Group (WSSG) is assigned the responsibility for making data governance decisions related to: (1) acquisition-related management systems, (2) the standards for making these data visible, and (3) a source of any individual data element.
- **Acquisition Enterprise Data Services.** Our demo has shown that getting AV SOA to work requires a separation of the institutions addressing functional data governance from those which operate and maintain the SOA infrastructure. The latter provides the all-important "utility services" for the data servers to operate for customers.
- **Functional Data Governance.** The initial priority must be to help improve decision-making for MDAP management, and I assign the functional data governance responsibilities for this class of AT&L's operations to the Director, Acquisition Resources and Analysis. This office also retains its responsibilities to operate and expand the utility of tools used in MDAP management, such as DAMIR and Kaleidoscope. I fully expect the other functional business areas of AT&L to develop their own needs for regulated data to be provided by this infrastructure, and each community is expected to develop their own data governance institutions to best exploit this new business model.
- **Resources.** For the balance of FY09, resources will be provided from within existing Defense-Wide funds. Going forward, I expect the costs of functional data governance to be funded out of the resources from each of the functional areas, but the cost of the SOA infrastructure requires a permanent basis. SOA infrastructure costs amount to approximately \$14 million annually, and I direct each of the Services to identify and make available \$4.7 million per year over the FYDP to be transferred to AT&L to support this infrastructure. My staff will work to make these transfers through appropriate processes as soon as practicable.

By implementing AV SOA as a durable institution, we will be providing the DoD acquisition community critical management insight that the commercial world achieved a generation ago: timely, coherent data that is reliably and transparently available throughout the acquisition enterprise. The continued cooperation of your organizations is paramount to this success. Careful data governance will not only lower our overall costs, it will prompt faster, better, acquisition decisions.

John L. Young, Jr.

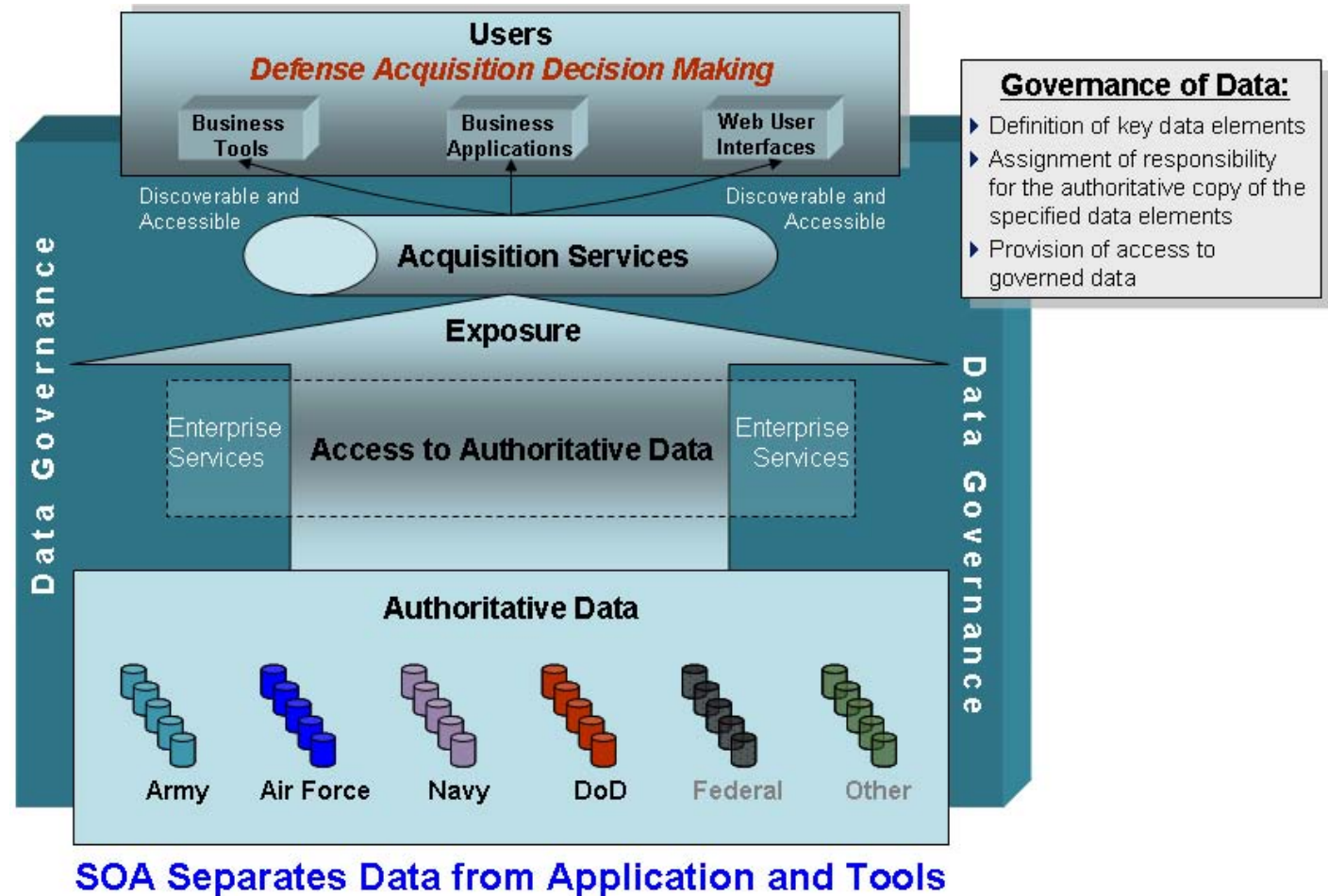
- ▶ USD AT&L issued AT&L AV SOA full implementation memo on March 5, 2009
- ▶ Directs AT&L to put in place all the elements of a durable solution to provide "acquisition data as a service" to the entire acquisition community.
  - Full Acquisition community access by June 09
  - All Major Defense Acquisition Programs (MDAPs) in time to support the FY 2011 program/budget review
- ▶ Separates data governance and SOA infrastructure responsibilities
- ▶ Weapon System Lifecycle Management Senior Steering Group to make all formal governance decisions
  - Director of Acquisition Resources and Analysis responsible for functional data governance for MDAP management
  - Other functional business areas to develop functional data governance to meet their decision-making information needs



## Defense Acquisition Visibility via SOA

- ▶ **AV SOA Solution:**  
Apply Service Oriented Architecture and data governance to create shared services

- ▶ **Results:**
  - Defense acquisition information transparency across the Department
  - Access to up-to-date, reliable data via any authorized application or analysis tool
  - An extensible platform available for Department-wide use



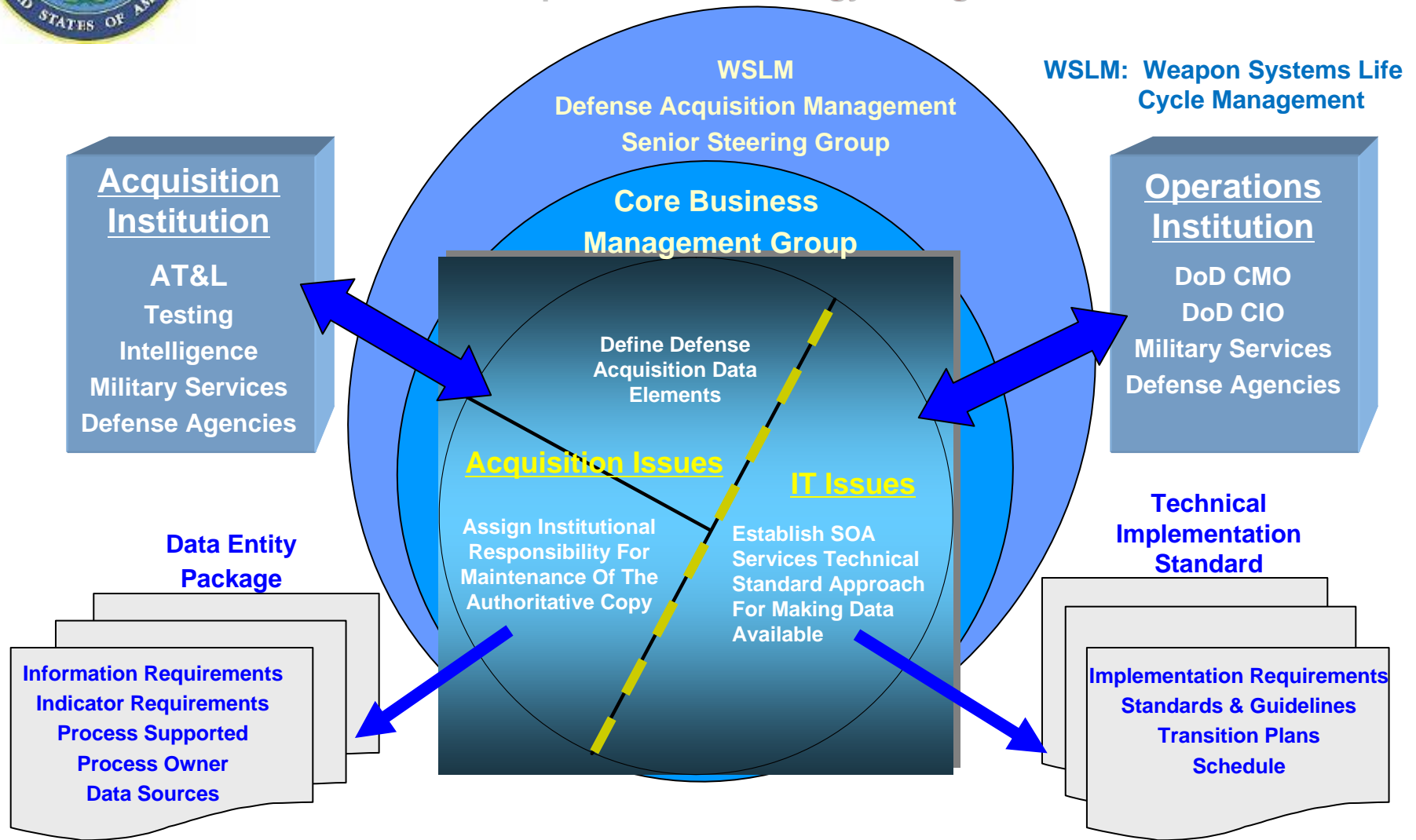
*"I reject the idea that the federal government cannot innovate." – Vivek Kundra, Federal CIO*





# Balancing Functional and Technical Equities

## Acquisition Technology & Logistics





# Definition of Success

## Demonstrating Data Governance

- Define selected Defense acquisition data elements to be exchanged
- Identification of authoritative sources
- Assign institutional responsibility for maintenance of the authoritative copy of each data element within a system

## Demonstrating Data Definition Consistency

- Availability of data defined as requested by AT&L
- For the demo, the bar is low: primarily EV- and Nunn-McCurdy-related data

## Demonstrating Data Access

- Implementing the SOA infrastructure



## AV SOA Data Categories

- ▶ *EVM* – Contract elements included in DAMIR’s “Contract Data Point” and/or reported on the Contract Performance Report (CPR) to track progress
- ▶ *Unit Cost* – Current estimate vs. APB (current and original) at total-appropriation level (RDT&E, Procurement, MILCON, O&M), by fiscal year for comparison, to support risk identification
- ▶ *Budget* – Current President’s Budget and POM/BES submission, by appropriation and fiscal year, for identifying changes in budget positions
- ▶ *Milestone* – Program milestones as agreed upon in the APB, to provide a reference point for tracking progress
- ▶ *Science & Technology* – Compare Key Performance Parameters, thresholds, and objectives to current measurement and to identify critical technologies
- ▶ *Program Administration* – To organize/view information by program, sub-program, budget activity, program element, budget line item, and/or project code



## AV SOA Data Elements – 148

Program Administration		Unit Cost (cont'd)	
	Program Name		Current Estimate - O&M (BY) - Total for all years
	Program Number (PNO)		Current Estimate - Development Quantity
	Program URI (Uniform Resource Identifier)		Current Estimate - Procurement Quantity
	Sub-Program URI		Original Baseline (APB): Development Quantity
	Sub-Program Name		Original Baseline (APB): Procurement Quantity
	Budget Activity Identifier		Current Baseline (APB): Total RDT&E Cost
	PE (Program Element)		
	Budget Line Item (formerly Procurement Line Item(PLI))		
	PM Management Reserve		
	Project Code		
Unit Cost		Budget	
	Current Baseline (APB): Total Procurement Cost		Original Quantity
	Current Baseline (APB): Total MILCON Cost		Current Quantity
	Current Baseline (APB): Total O&M Cost		Scheduled Quantity
	Current Baseline (APB): Total Development Quantity		Delivered Quantity
	Current Baseline (APB): Total Procurement Quantity		Budget Fiscal Year
	PAUC (Program Acquisition Unit Cost) - Current Estimate		OTB (Over Target Baseline) - Date
	APUC (Average Procurement Unit Cost) - Current Estimate		OTB - BAC Adjustment (\$)
	Estimate Type		OTB - SV Adjustment (\$)
	Base Year - Original APB		OTB - CV Adjustment (\$)
	Base Year - Current APB		NCC - Original
	Original APB Date		NCC (Negotiated Contract Cost) - Current
	Current APB Date		Target Price - Current
	Program Completion Year		Target Price - Original
	Escalation Index		Estimated Price - Contractor
	Department Regular Code		Estimated Price - PM
	Main Account Code		Ceiling Price - Current
	Appropriation FY (Fiscal Year)		Ceiling Price - Original
	Current Estimate - Research, Development, Test & Evaluation (RDT&E) costs		Ceiling Price - Contractor's Estimated
	Current Estimate - Procurement Costs		Ceiling Price - PMs Estimated
	Current Estimate - Military Construction (MILCON) Costs		Completion Date (when BCWS = BAC)
	Current Estimate - Operation & Maintenance (O&M) Costs		TAB (Total Allocated Budget)
	Current Estimate - Development Quantity		ACWP (Actual Cost of Work Performed)
	Current Estimate - Procurement Quantity		Current President's Budget RDT&E Submission
	Original Baseline (APB): Total RDT&E Cost		Current President's Budget Procurement Submission
	Original Baseline (APB): Total Procurement Cost		Current President's Budget MILCON Submission
	Original Baseline (APB): MILCON Cost		Current President's Budget O&M Submission
	Original Baseline (APB): O&M Cost		Current President's Budget Development Quantity Submission
	Current Estimate - RDT&E (BY) - Total for all years		Current President's Budget Procurement Quantity Submission
	Current Estimate - Procurement (BY) - Total for all years		RDT&E POM/BES Submission
	Current Estimate - MILCON (BY) - Total for all years		Procurement POM/BES Submission
			MILCON POM/BES Submission
			O&M POM/BES Submission
			POM/BES Development Quantity
			POM/BES Procurement Quantity

10



## Backup



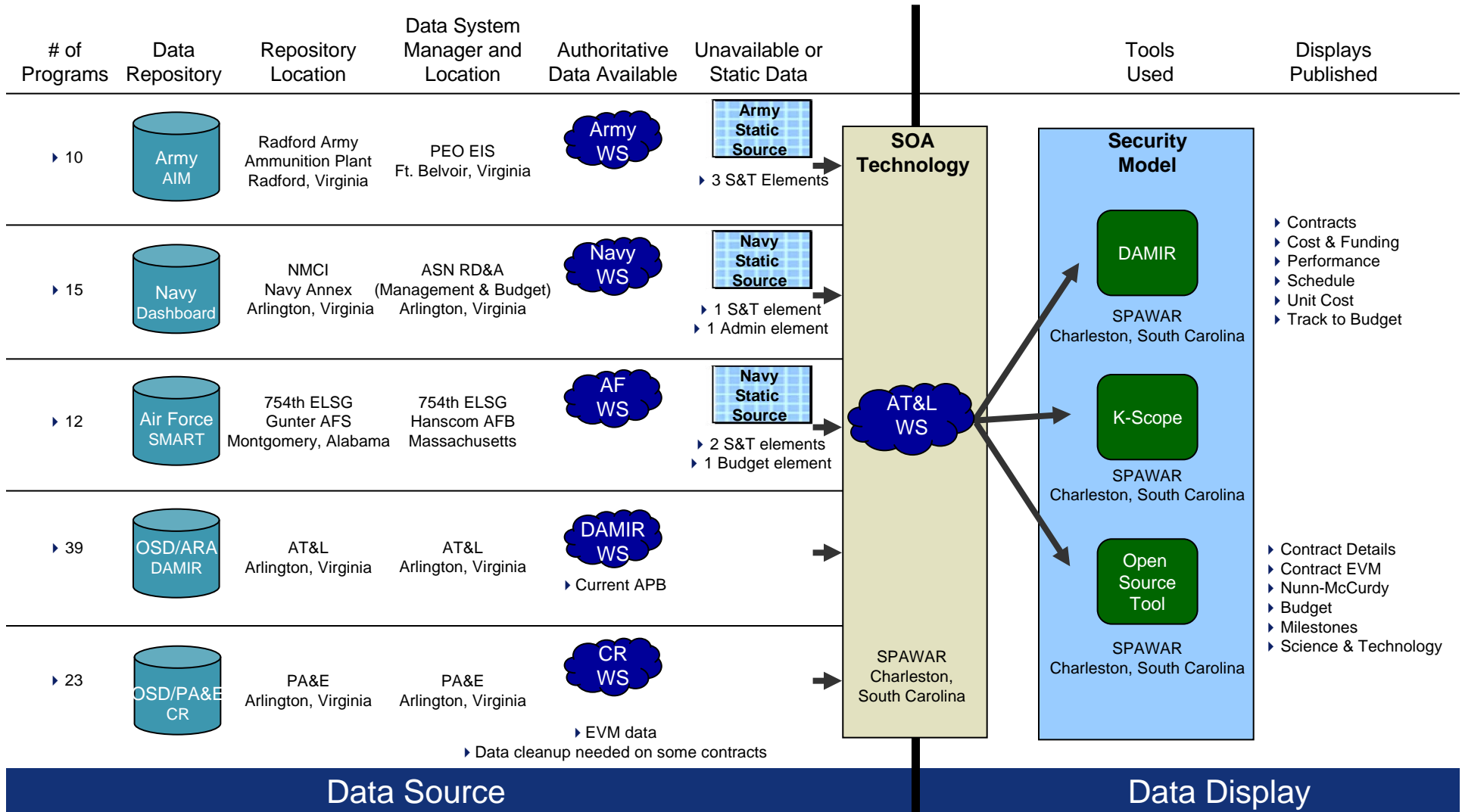
# Defense Acquisition Data Governance: Enabling Acquisition Visibility

## Data Entity Package

- ▶ Acquisition Technology & Logistics created an online tool, the Data Entity Package (DEP), for managing governance of Defense acquisition data
- ▶ For each element—by program—DEP specifies the data definition, authoritative source, individual responsible for maintaining the authoritative copy of that data element
- ▶ DEP is a 'contract' between players in the SOA environment
- ▶ Acquisition Technology & Logistics governance organization is the authority for establishing data priorities
- ▶ Having brought a new data element under governance, implementation requires technical integration to be included in the AV SOA



# AT&L AV SOA Pilot Architecture







## AT&L AV SOA Pilot – Army Programs

PNO#	SERVICE	TITLE	LONG TITLE
182	ARMY	LUH	Light Utility Helicopter
202	ARMY	AB3	Apache Block III
219	ARMY	ATIRCM/CMWS	<b>Advance Threat Infrared Countermeasures / Common Missile Warning System</b>
260	ARMY	GMLRS	<b>Guided Multiple Launch Rocket System</b>
278	ARMY	CH-47F	Cargo Helicopter
294	ARMY	FBCB2	Force XXI Battle Command Brigade and Below Program
299	ARMY	STRYKER	Armored Vehicle
301	ARMY	FCS	<b>Future Combat Systems</b>
341	ARMY	BLACK HAWK UPGRADE (UH-60M)	<b>Utility Helicopter Upgrade Program</b>
346	ARMY	WIN-T INCREMENT 1	<b>Warfighter Information Network</b>
347	ARMY	GCSS ARMY	Global Combat Support System Army
349	ARMY	WIN-T INCREMENT 2	<b>Warfighter Information Network - Tactical Increment 2</b>
350	ARMY	WIN-T INCREMENT 3	<b>Warfighter Information Network - Tactical Increment 3</b>
366	ARMY	EXCALIBUR	<b>Family of Precision, 155mm Projectiles</b>
367	ARMY	HIMARS	High Mobility Artillery Rocket System
372	ARMY	JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
420	ARMY	ER/MP UAS	Extended Range Multi-Purpose Unmanned Aircraft System
531	ARMY	PATRIOT/MEADS CAP	<b>Patriot/Medium Extended Air Defense System Combined Aggregate Program</b>
601	ARMY	BRADLEY UPGRADE	Bradley Fighting Vehicle System Upgrade
746	ARMY	FMTV	<b>Family of Medium Tactical Vehicles</b>
831	ARMY	Longbow Apache	Airframe Modifications on the Apache Helicopter

**Bolded programs were included in Pilot Phase 1**



## AT&L AV SOA Pilot – Navy Programs

PNO#	SERVICE	TITLE	LONG TITLE
101	NAVY	H-1 UPGRADES (4BW/4BN)	United States Marine Corps Mid-Life Upgrade to AH-1W Attack Helicopter and UH-1N Utility Helicopter
<b>161</b>	<b>NAVY</b>	<b>CVN 68</b>	<b>NIMITZ CLASS Nuclear Powered Aircraft Carrier</b>
<b>178</b>	<b>NAVY</b>	<b>TRIDENT II MISSILE</b>	<b>Sea Launched Ballistic Missile</b>
180	NAVY	DDG 51	ARLEIGH BURKE CLASS Guided Missile Destroyer
191	NAVY	MH-60R	Multi-Mission Helicopter Upgrade
<b>197</b>	<b>NAVY</b>	<b>DDG 1000</b>	<b>ZUMWALT CLASS Destroyer</b>
<b>212</b>	<b>NAVY</b>	<b>V-22</b>	<b>OSPREY Joint Advanced Vertical Lift Aircraft</b>
<b>223</b>	<b>NAVY</b>	<b>CVN 78</b>	<b>GERALD R. FORD CLASS Nuclear Aircraft Carrier</b>
238	NAVY	JPALS	Joint Precision Approach and Landing System
247	NAVY	JHSV	Joint High Speed Vessel
253	NAVY	VTUAV	Vertical Takeoff and Land Tactical Unmanned Aerial Vehicle (Fire Scout)
282	NAVY	MH-60S	Multi-Mission Combat Support Helicopter
286	NAVY	RMS	Remote Minehunting System
289	NAVY	TACTICAL TOMAHAWK	Follow-on to TOMAHAWK Baseline missile program
290	NAVY	NMT	Advanced Extremely High Frequency Navy Multiband Terminal Satellite Program
333	NAVY	LHA 6 - AMERICA CLASS	Amphibious Assault Ship
<b>334</b>	<b>NAVY</b>	<b>P-8A</b>	<b>Poseidon Program</b>
<b>345</b>	<b>NAVY</b>	<b>MUOS</b>	<b>Mobile User Objective System</b>
353	NAVY	JOINT MRAP	Joint Mine Resistant Ambush Protected Vehicles
<b>364</b>	<b>NAVY</b>	<b>E-2D AHE</b>	<b>E-2D Advanced Hawkeye</b>
365	NAVY	COBRA JUDY REPLACEMENT	COBRA JUDY REPLACEMENT
368	NAVY	AGM-88E AARGM	AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) Program
373	NAVY	BAMS UAS	Broad Area Maritime Surveillance Unmanned Aircraft System
374	NAVY	LCS	Littoral Combat Ship
<b>378</b>	<b>NAVY</b>	<b>EA-18G</b>	<b>Airborne Electronic Attack Variant of the F/A-18 Aircraft</b>

PNO#	SERVICE	TITLE	LONG TITLE
<b>390</b>	<b>NAVY</b>	<b>CH-53K</b>	<b>Heavy Lift Replacement Program</b>
<b>391</b>	<b>NAVY</b>	<b>SM-6</b>	<b>Standard Missile 6</b>
418	NAVY	IDECM	Integrated Defensive Electronic Countermeasures
419	NAVY	EA-6B ICAP III	EA-6B Improved Capability (ICAP) III Program
<b>515</b>	<b>NAVY</b>	<b>EFV</b>	<b>Expeditionary Fighting Vehicle</b>
<b>516</b>	<b>NAVY</b>	<b>SSN 774</b>	<b>VIRGINIA CLASS submarine</b>
542	NAVY	LPD 17	SAN ANTONIO CLASS Amphibious Transport Dock Ship
<b>549</b>	<b>NAVY</b>	<b>F/A-18E/F</b>	<b>SUPER HORNET Naval Strike Fighter</b>
581	NAVY	AIM-9X	Air-to-Air Missile Upgrade
582	NAVY	CEC	Cooperative Engagement Capability
592	NAVY	T-AKE	LEWIS AND CLARK Class of Auxiliary Dry Cargo Ships
766	NAVY	JSOW (BASELINE/UNITARY)	Joint Standoff Weapon Baseline Variant and Unitary Warhead Variant

**Bolded programs were included in Pilot Phase 1**

**Red bolded programs are off the FY2009 MDAP List but being maintained in AVSOA**



## AT&L AV SOA Pilot – Air Force Programs

PNO#	SERVICE	TITLE	LONG TITLE
166	USAF	NAVSTAR GPS	Global Positioning System
<b>176</b>	<b>USAF</b>	<b>EELV</b>	<b>Evolved Expendable Launch Vehicle</b>
185	USAF	AMRAAM	Advanced Medium Range Air-to-Air Missile
199	USAF	FAB-T	Family of Beyond Line-of-Sight Terminals
200	USAF	C-17A	GLOBEMASTER III Advanced Cargo Aircraft Program
<b>210</b>	<b>USAF</b>	<b>SBIRS HIGH</b>	<b>Space-Based Infrared System Program, High Component</b>
220	USAF	C-130J	HERCULES Cargo Aircraft Program
<b>224</b>	<b>USAF</b>	<b>B-2 EHF INCREMENT I</b>	<b>B-2 Advanced Extremely High Frequency SatCom Capability</b>
237	USAF	GBS	Global Broadcast Service
<b>239</b>	<b>USAF</b>	<b>NPOESS</b>	<b>National Polar-Orbiting Operational Environmental Satellite System</b>
<b>248</b>	<b>USAF</b>	<b>Minuteman III PRP</b>	<b>Minuteman III Propulsion Replacement Program</b>
252	USAF	GLOBAL HAWK (RQ-4A/B)	GLOBAL HAWK (RQ-4A/B)
261	USAF	AEHF	Advanced Extremely High Frequency Satellite Program
<b>265</b>	<b>USAF</b>	<b>F-22</b>	<b>RAPTOR Advanced Tactical Fighter</b>
271	USAF	PREDATOR	Unmanned Aircraft System
273	USAF	C-5 AMP	C-5 Aircraft Avionics Modernization Program
277	USAF	AWACS UPGRADE	AWACS Upgrade
292	USAF	GPS-III A	Global Positioning Satellite III
293	USAF	MP RTIP	Multi-Platform Radar Technology Insertion Program
<b>298</b>	<b>USAF</b>	<b>C-130 AMP</b>	<b>C-130 Aircraft Avionics Modernization Program</b>
326	USAF	WGS	Wideband Global SATCOM Program
<b>327</b>	<b>USAF</b>	<b>C-5 RERP</b>	<b>C-5 Aircraft Reliability Enhancement and Re-engining Program</b>
328	USAF	SBSS B10	Space-Based Space Surveillance Block 10
354	USAF	SDB-I	Small Diameter Bomb Increment I

PNO#	SERVICE	TITLE	LONG TITLE
357	USAF	LAIRCM	Large Aircraft InfraRed CounterMeasures Program
375	USAF	ASIP	Airborne Signals Intelligence Payload Program
<b>376</b>	<b>USAF</b>	<b>B-2 RMP</b>	<b>B-2 Radar Modernization Program</b>
387	USAF	KC-X	Tanker Replacement Program
<b>394</b>	<b>USAF</b>	<b>MPS INCREMENTS I - III</b>	<b>Mission Planning System Increments I - III</b>
424	USAF	REAPER	Unmanned Aircraft System
<b>503</b>	<b>USAF</b>	<b>JDAM</b>	<b>Joint Direct Attack Munition</b>
537	USAF	NAS	National Airspace System
<b>555</b>	<b>USAF</b>	<b>JASSM</b>	<b>Joint Air-to-Surface Standoff Missile</b>
560	USAF	JPATS	Joint Primary Aircraft Training System

**Bolded programs were included in Pilot Phase 1**

**Red bolded programs are off the FY2009 MDAP List but being maintained in AVSOA**



## AT&L AV SOA Pilot – Joint Programs

PNO#	SERVICE	TITLE	LONG TITLE
183	JOINT	JCA	Joint Cargo Aircraft
<b>198</b>	<b>JOINT-USAF</b>	<b>F-35 Lightning II</b>	<b>Joint Strike Fighter (JSF) Program</b>
243	JOINT	CHEM DEMIL-ACWA	Chemical Demilitarization Program - Assembled Chemical Weapons Alternatives
284	JOINT	JTRS NED	Joint Tactical Radio System Network Enterprise Domain
285	JOINT	CHEM DEMIL-CMA	Chemical Demilitarization Program - Chemical Materials Agency Program
360	JOINT	JTRS GMR	Joint Tactical Radio System Ground Mobile Radio
362	JOINT	BMDS	Ballistic Missile Defense System Program
380	JOINT	AMF JTRS	Joint Tactical Radio System Airborne & Maritime/Fixed Station
385	JOINT	JTRS HMS	Joint Tactical Radio System Handheld, Manpack, and Small Form Fit Radios
554	JOINT	MIDS	Multi-Functional Information Distribution System

**Bolded programs were included in Pilot Phase 1**